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ACTIVITIES OF THE ALL-UNION SCIENTIFIC AND TECHNICAL SOCIETY
OF RADIO ENGINEERING AND ELECTRICAL COMMUNICATIONS IMENI A. S. POPOV

CONFERENCE ON INDUSTRIAL APPLICATIONS OF HIGH-FREQUENCY CURRENTS

In accordance with the work plan for the Organization Bureau of the All-Union Scientific and Technical Society of Radio Engineering and Electrical Communications (VNORIE) imeni A. S. Popov, a conference has been scheduled on industrial applications of high-frequency currents. The conference will be held, in conjunction with interested organizations, in Leningrad in October-November 1949.

The organizing committee in charge of convening the conference is composed of:

Chairman

Vologdin, V. P., corresponding member, Academy of Sciences USSR.

Members

Kontor, I. I., deputy director, Scientific Research Institute Ministry of the Automobile and Tractor Industry.

Shepelyakovskiy, K. Z., chief, high-frequency current shop, Automobile Plant imeni Stalin.

Stolyarov, L. G. vice-chairman, Organization Bureau, VNORIE.

Rozinskiy, V. Yu., candidate in technical sciences, vice-president of Leningrad Division, VNORIE.

Bel'mer, P. F., laboratory chief, Scientific Research Institute of the Aviation Industry.

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Gulyayev, A. P., professor, doctor of technical sciences, chairman of Metal Studies Committee, All-Union Technical Society (VNITO) of Machine Builders.

Mondrus, B. D., chief engineer, Electric Furnace Trust, Ministry of the Electrical Industry.

Lapshin, V. A., assistant chief engineer, Gor'kiy Automobile Plant (GAZ) imeni Molotov.

Lozil'skiy, M. G., candidate in technical sciences, senior scientific collaborator, Institute of Metallurgy, Academy of Sciences USSR.

Lychkovskiy, V. L., engineer. Gor'kiy Department, VNITO of Power Engineering.

Kokurin, S. N., professor, chief, Chair of Radio Engineering, MAI (Moscow Aviation Institute).

TECHNICAL CONFERENCE ON PROBLEMS OF FREQUENCY MANIPULATION

A technical conference on frequency manipulation problems was held in Moscow, 12 - 15 July 1949. It was convened by the Ministry of Communications in conjunction with VNORIE imeni A. S. Popov. Workers of the TsNIIS (Central Scientific Research Institute of Telecommunications) of the Ministry of Communications and operational workers took part in the conference.

M. U. Polyak, chief, Technical Division, Ministry of Communications and member, Organization Bureau, VNORIE, who opened the conference, emphasized the enormous importance of trunk-line radio communication in the general system of communications and remarked that its steady operation is the basic factor in determining the quality of work of the USSR telegraphic network.

In the past few years, especially in 1948, the effectiveness of the operation of radio communications has been considerably increased, due mainly to the introduction of interference-free systems designed by Soviet engineers using the principle of frequency manipulation of carrier frequency. Soviet engineers Mek'nikov, Smirnov, Belov, Magazanik, Agapov, Korol', and others have done much work on designing apparatus to increase the stability of radio communications. Engineers and operators such as Uspenskiy, Yegorov, Kharlamov, and Orlov are assisting in the introduction of interference-free systems.

Polyak stated that the conference had to solve a number of problems, among them an assessment of the effectiveness of methods of frequency manipulation used in radio communications and recommendations for the further introduction of these methods; it had to assess the good and bad qualities of the apparatus produced, and work out recommendations on methods of operating ChM (English equivalent is FM) communications and on controlling the performance of interference-free systems.

Several papers were read at the conference.

V. S. Mel'nikov, in his paper "Prospects for the Development of Frequency Manipulation Systems," explained the basic features of these systems and the physical principles of increasing interference resistance; he examined the problem of potential interference-resistance and prospects of its application. He remarked on the feasibility of using a system of narrow-band frequency manipulation and, in conclusion, examined methods of combating pulse and other interferences.

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In his paper, "A Standard Exciter for Frequency Manipulation for Trunk-Line Communication Transmitters," A. A. Magazanik gave an account of the general requirements for modern frequency manipulators and a brief survey of existing systems. He explained the principles which govern the design of a standard frequency manipulator, gave its circuit, and showed how it could be used for operations on a two-channel carrier telegraph system (DChT). In conclusion, he announced the preliminary results of operating the first series of manipulators.

I. F. Agapov read a paper on the DChT system in which he explained the operating principle of this interference-free system of multichannel telegraphy. Of all multichannel radio communication systems known at present, the DChT system offers the simplest solution to the problem of establishing two radiotelegraph communication links with frequency manipulation. Agapov examined transmission for reception methods, noting the high efficiency of DChT in comparison with other systems, and produced data on the results of the practical application of DChT in radio communications.

L. A. Kopytin's paper was devoted to problems of planning modern communication lines.

V. D. Kuznetsov gave a paper on the subject, "High-Efficiency Traveling Wave Antennae."

In his paper, "Telephony on One Side Band," I. V. Ostrovskiy expounded general considerations on the single-band system of transmission and its advantages. He examined the power relationships involved and also the technical methods of obtaining single side-band frequencies. He formulated requirements for the qualitative indexes of single-band transmission and receiving channels and indicated the applications of a single-band transmission system.

Appropriate recommendations were discussed and passed at the closing plenary session of the conference on 15 July 1949.

The conference noted that the introduction of carrier telegraphy apparatus, designed and manufactured by Soviet specialists, has considerably improved the stability of operation of communication lines and increased the operating efficiency of radio channels. Considerable power economy was realized as a result, since transmitter power could be reduced to 40-60 percent of the nominal values.

The development of a highly efficient DChT system on the basis of standard ChM apparatus has, in essential cases, enabled a second communication channel to be opened with minimum additional expenditure, thus doubling the capacity of the radio line.

The conference recommended a number of measures for improving the functioning of trunk lines, in particular, further introduction of ChM and two-channel carrier telegraphy (DChT).

Concrete recommendations were made concerning further production of receiver racks for the PChM-1 carrier telegraph equipment, and improving the control point checks to keep frequency deviations within 2 percent of nominal under operational conditions.

For checking manipulative channels, it was recommended that a two-channel oscillograph be designed and that production of universal level indicators of a single type be organized. It was also recommended that instructions be drawn up in 1949 regarding methods of reducing transmitter power and plans worked out for encouraging workers to effect power savings on communication lines.

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